Volume Meshing of 2 1/2 D
or "Extrudable" Geometries
Using Sweeping Tools

Sandia
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Sweeping Algorithm

Start at a meshed "source surface" and "sweep"

through the geometry creating hexes as you go until

you reach a "target surface" that is topologically

equivalent to the "source surface".

Sweeping Tools

- **Translate**

- **Rotate**

- **Project**

Sweeping

Translate

Geometry Characteristics

- **Source and target surfaces must be parallel**

- **Cross section between source and target surfaces must be constant**

- **You must be able to translate the source surface along a vector and have it completely overlay the target surface**

- **You can have multiple source surfaces**

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Translate

Strengths

- **Fast**

- **Memory Efficient**

Weakness

- **The geometry this algorithm is applicable to is limited**

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Rotate

Geometry Characteristics

- **Source and target surfaces must connected by a conic or toroidal surface**

- **Cross section between source and target surfaces must be constant**

- **You must be able to rotate the source surface about a single axis and have it completely overlay the target surface**

- **Source surface cannot touch rotation axis**

Rotate

Strengths

- **Fast**

- **Memory Efficient**

Weakness

- **The geometry this algorithm is applicable to is limited**

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Project

Geometry Characteristics

- **Completely general sweep path**

- **Source and target surfaces need not be parallel**

- **Cross section between source and target surfaces need not be constant**

- **Multiple linking surfaces may exist**

- **Multiple source surface may exist**

Sweeping

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Project

Strengths

- **This algorithm handles a lot of different geometries**

Weaknesses

- **This algorithm is more memory intensive than translating or rotating**

- **This algorithm is slower than translating or rotating**

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